Dynamic Active Networks Services

Carlo Tarantola
Warsaw Mobile and Wireless Expertise Center
carlo.tarantola@oracle.com

Abstract

This poster/demo highlights research done at Oracle's Warsaw Mobile and Wireless Center of Expertise to develop and manage in a dynamic way new services for telecommunications/data networks. Called Dynamic Active Networks Services (DANS), the architecture combines legacy and new components of a network with a set of protocols and algorithms by which networks operators and service providers can actively provide users with a wide range of services. We propose architecture and protocols for defining new services. The architecture treats the entire service environment as a dynamic, distributed system and we leverage concepts from Active Networking to deal with active nodes providing services within a network. The novelty is the ties between distributed systems and active networking.

1. Discussion

The DANS Framework is an architecture that provides the possibility to compose devices and services they provide, into a single, dynamic distributed system. The resulting federation provides simplicity of access, facility of administration, and support in sharing information similar to that provided by large monolithic systems. It also retains the flexibility and control provided by personal computers or workstations.

The term "active network" is to be interpreted as mobile code rather than the usual code-per-packet approach [1]. Moreover the word "active" is not only related to programmable intelligent agents, but also to services that are reactive and that are deployed in a dynamic way.

The most important concept within this architecture is that of service. Services can be divided into pull-based and push-based. In the former case, services are activated on user demand, e.g. server keeps the latest news in categories and user selects the appropriate category from which he wants to download something. In the latter, user's subscription drives server behavior and, referring to the user's profile, server pushes information when triggered by some event, e.g. arrival of new mail or an update for a stock quote.

DANS is based on SIP [2] to locate, register and use the services and mobile code that is available in the network.

An active framework service is not only some specific information required by the user (such as stock rates or train time schedules) but is also a reactive mechanism that would enable activities such as sending documents to the nearest printer, or sending messages or binaries to any new device that has just been connected to the network, without the help of a system administrator. The consequence is that the service provider may surely be a software house, which operates the service for the stock exchange, but also the electronic device that is empowered with the task of doing something.

We present work done to build applications that benefit of active nodes in a network. These active nodes offer services that are triggered and potentially created by the same applications. Thanks to the support of location aware mechanisms, the result is that true context sensitive, presence ready applications can be built and deployed. Moreover we are able to have (Active) Networks, which identify users and content in order to optimize delivery according to business priorities.

2. References

[1] D.L. Tennehouse, J.M. Smith, W.D. Sincoskie, D.J. Wetherall, and G.J. Winden. A Survey of Active Network Research. IEEE Communications Magazine, pp80-86, Jan 1997

[2] Schulzrinne, Rosenberg, The Session Inititation Protocol: Internet Centric Signaling, IEEE Communications Magazine, October 2000, pp. 134-141